

The Center for a Sustainable Future at GCC

Fall 2012 Course Schedule

Technical and Business Development Knowledge and Skills for Greening Our Economy

Connecticut's new comprehensive energy, business growth and workforce development policies and programs are driving the expansion of a more energy efficient clean energy economy.

Gateway Community College has taken the lead in preparing students for clean energy occupational roles by offering programs that teach the "middle-level technical skills" students need to succeed. "Middle-level" is a term that recently has been used to describe functional education that is not research-oriented. It covers the practical business development and technical background needed to succeed in professional roles identified by practitioners and organized into curricula by educators.

Affiliated with the **North American Board of Certified Energy Practitioners (NABCEP)** since the first solar photovoltaic entry-level course we offered in 2008, the CSF also has worked with numerous professional associations and groups to provide green occupational learning opportunities for roles in our emerging clean energy economy.

Most of our technical skills training take place in the college's new state-of-the-art solar photovoltaic and solar thermal lab located on the North Haven campus. We are thankful for the financial support of the **CT Clean Energy Finance and Investment Authority and the Northeast Photovoltaic Training Network** in building this great new facility.

As our solar education program matured, we increased the number of our offerings. This fall, in a major design revision, we will offer a new set of program options that include courses that are both shorter in length and less costly to attend. Also, our new schedule provides ways for NABCEP certification candidates to earn the 18 hours of advanced training that go beyond entry-level class hour requirements:

Solar Fundamentals and Site Surveys is a new 12-hour course pre-requisite for those seeking eligibility to sit for the NABCEP entry-level exams in solar photovoltaics and solar heating and for the photovoltaic technical sales exam. This course will be offered at multiple intervals during the course of the academic year.

Our **Solar Photovoltaic and Solar Heating Entry-Level** non-credit courses have been reduced to 32 hours. This enables us to schedule more convenient times and to lower the cost of registration.

Solar Photovoltaic Technical Sales is now divided into three 9-hour courses that include **System Design, Financing, and Sales Presentations**.

Managing Your Sustainable Business, another new course, takes on the challenges of establishing excellent business practices and customer relationship procedures including cost estimating, graphical presentations, invoicing, sales proposals, warranties and service contracts, and organizing an effective home office.

Advanced Solar Photovoltaics is designed to satisfy the new NABCEP requirements for 18 hours of advanced classroom training. Design plans, line drawing, installation techniques, electrical permitting, and inspection documents are all targeted in this course.

This fall's program also includes a revised **Sustainable Business Development Topics** lecture series, **Battery Basics for Photovoltaics**, solar energy consumers' programs, an **Introduction to Geothermal**, **Building Science for Practitioners**, **Project Management**, and the launch of a new **Sustainable Business Incubators' Group**.

Solar Energy Learning for Operators

Solar Fundamentals and Site Surveys

(Pre-requisite for solar photovoltaics and solar heating (thermal), as well as for Solar Photovoltaic Technical Sales.)

Solar Energy Fundamentals provides essential knowledge for those seeking to participate in any of the more specialized technical courses we offer in Solar Photovoltaics, Solar Heating (Thermal), Photovoltaic Technical Sales, Battery Based PV Systems, other solar special topics, and understanding the relationship between solar energy and what we commonly think of as basic electricity. This course also will be of interest to smart solar shoppers, solar system owners, and those with general interest in solar energy.

[CRN#4082 \(changed from 4101\)](#), Wednesday, 5:30 – 9:30 pm, September 12, 19, 26, Solar Energy Lab (NoH), \$200, Instructor: Gail Burrington

[CRN#4101 \(changed from 4082\)](#), Wednesday, November 28 – December 19, (NH), \$200, Instructor: Gail Burrington

Solar Photovoltaic Entry-Level

(Solar Fundamentals and Site Surveys highly recommended to take before this course and required for NABCEP entry-level exam eligibility.)

[CRN#4081](#), Wednesday, 5:30 – 9:30 pm, October 3 – November 7, Solar Energy Lab (NoH), \$620, Instructor: Gail Burrington

The best overall preparation for a solar energy career! Focusing on entry-level knowledge and skills, this course prepares students for the (NABCEP) entry-level photovoltaic exam. Based on but not limited to teaching the recommended NABCEP task analysis and learning objectives, this course provides instruction in the component steps of installing photovoltaic energy systems. Learning takes place in a "hands-on" "minds-on" solar energy lab that features working solar photovoltaic systems. Our stationary photovoltaic installations display proper siting, panel installation, safety devices, meters, and energy information relay sensors for Internet monitoring, and a grid-tie connection. Our solar lab's mock roof enables practice panel

installation, appropriate use of hand tools, and other lab-based exercises that involve the commissioning, maintenance, and performance of solar photovoltaic systems.

The CT Clean Energy Finance Investment Authority now requires that at least one full-time employee of an approved installer company will have taken the entry level course and passed the NABCEP photovoltaic entry-level exam. Students have had a VERY high “PASS” rate on the NABCEP exam after taking the GCC course. Will that be you? (NABCEP Entry-Level Photovoltaic Exam eligible)

Solar Photovoltaic Technical Sales

(Solar Fundamentals and Site Surveys and Solar Photovoltaic Entry-Level provide the best preparation before taking this course.)

Do you have sales experience or a “sales personality” and want to take advantage of CT’s new burgeoning opportunities in professional PV sales? Gain the information and tools you need to sell grid-connected, residential, solar photovoltaic systems. Learn how to conduct a PV solar system, prepare a sales estimate, explain the benefits to the homeowner, and close the contract. Learn about solar energy, problems associated with shading and optimizing orientation, and tilt for PV arrays--all critical aspects of design to serve the customers’ electrical loads. Now offered in three sections, please take in order for best results

System Design: Solar Photovoltaic Technical Sales

[CRN#4091](#), Monday, 6:30 – 9:30 pm, October 1, 15, 22, 29, Solar Energy Lab (NoH), \$175, Instructor: Peter Governale

Learn about building systems energy consumption, energy auditing, how building efficiency can lower the size estimate of a PV system, system sizing, estimating the cost of construction and photovoltaic systems, grid tie connects and net metering, zoning and permitting issues, federal, state, and manufacturer incentives, and computing the customer’s return on investment.

Financing Solar Photovoltaic Systems: Solar Photovoltaic Technical Sales

[CRN#4097](#), Monday, 6:30 – 9:30 pm, November 5, - 26, (NoH), \$175, Instructor: Peter Governale

Explore the best ways for financing solar photovoltaic system installations that take advantage of purchase, lease, and power purchase agreements (PPAs). Learn how to deduct the amount of state and federal incentives from the overall cost of these systems, accelerated depreciation, and how to estimate the return on investment over time. Find out more about how Connecticut's new energy programs help homeowners, apartment dwellers, condominium owners, community neighborhood associations, and commercial entities to lower energy costs and reduce operating expenses, including CT's new Commercial Property Assessed Clean Energy Program (PACE). Learn how the ZREC Program (zero emissions renewable energy credit program) provides renewable energy credits and quarterly payments to zero emissions solar photovoltaic energy producers.

Sales Presentations: Making the Case for Solar Photovoltaic Technical Purchases: Solar Photovoltaic Technical Sales

[CRN# 4098](#), Monday, 5:30 – 9:30 pm, December 3 – 17, (NoH), \$175, Instructor: Peter Governale

As a sales person you will have to document leads to identify markets and customers, *break the ice* with customers, qualify them as buyers, and assess their needs. Learn best methods for working with customers as well as preparing and personalizing a customer presentation, persuading customers with slide presentations and flipcharts, and using software to estimate energy needs and costs, and to determine return on investment. Learn how to present financing options to customers that give them the information they need to commit to renewable energy investments.

Managing Your Sustainable Business

[CRN#4099](#), Monday, 4 – 6 pm. Solar Energy Lab, October 1, 15, 22, 29, November 5, 12, (NoH), \$175, Instructor: Peter Governale

A sustainable business requires an efficient and effective back office operation as much as it requires technical skill, knowledge of financial options, and sales. An effective back office means customer availability, documentation of records, accounting methods, advertising, and customer relationships. An effective back office can make the difference in confirming appointments, estimating costs, and preparing winning proposals. Learn best methods for invoicing,

providing warranties and service contracts, and keeping in touch with your customers over time.

Advanced Solar Photovoltaics

(Satisfies NABCEP certification requirements for 18 hours of advanced classroom training)

[CRN#4092](#), Thursday, 4 – 7 pm, October 18 – November 15, Solar Energy Lab, (NoH), \$265, Instructor: Michael Kocsmiersky

Gain real world knowledge and experience at the intermediate to advanced level in one of the most advanced solar PV labs in Connecticut. Learn “minds-on, hands-on” techniques for proper solar design and installation, as well as electrical layout, structural engineering, mechanical design and engineering, wire selection and sizing, balance of system components, solar array design and panel selection, inspection fundamentals, electrical calculations, OSHA standards, and permitting and contracting. This is an ideal course for contractors and those seeking to move up the career ladder in their jobs. (NABCEP advanced classroom hours eligible)

Battery Basics for Photovoltaics

[CRN#4084](#), Saturday, 10 am – 12 pm, December 1, Solar Energy Lab, (NoH), \$77, Instructor: Gail Burrington

Look beyond simple “grid-tied” PV and still feed power to critical appliances when electric service is not available. In this basic “short course” learn about using solar charged battery technology for communications, outdoor signs and lighting, and stand-alone solar electric installations. “Hands-on” learning experience in the college’s new solar PV lab will focus on appropriate installations, start-up tests, troubleshooting techniques, and workplace safety. This program will interest those who have taken the Solar PV Entry-Level course, home owners interested in small PV applications, and those in the PV industry seeking a more comprehensive understanding of grid-tied battery-based installations. An excellent in-depth review of battery systems, this course represents a great way to prepare for the NABCEP solar PV entry-level exam.

Solar Heating (Thermal) for Licensed Plumbers

24-Hour Solar Heating (Thermal) Course for Licensed Plumbers

[CRN#4085 \(changed from 4094\)](#), Thursday and Friday, 8:30 am – 3 pm, October 4, 5, 11, and 12, Solar Energy Lab, (NoH), \$350, Instructor: Michael Kocsmiersky

If you are a licensed plumber, you can learn this technology to offer your customers the renewable energy source with the greatest return-on-investment, yet the fewest number of qualified installers! This potential career bonanza is a professional development program for licensed plumbers who seek to install solar thermal systems. Learn solar energy fundamentals, including theory of solar light and energy wave forms, “insolation” values and how they are effected by location, season and climate, and heat transfer dynamics. Different types of solar water heating appliances will be covered as well as types of panel and tube installations, SRCC certifications, collector losses and efficiency curves, system sizing and design theory, practical/real world results vs. computer simulation, solar fraction calculation, and roofing standards. Installation best practices, project planning and audit reporting are covered as well as the theory behind system piping, pool heaters, safety relief valves, and other uses for solar heated water.

Solar Energy Learning for Consumers

Solar Photovoltaics for Your Home or Business

[CRN# 4080](#), Thursday and Friday, 5 -7 pm, October 4, 5, 11, and 12, Solar Energy Lab, (NoH), \$117, Instructor: Michael Kocsmiersky

You are already seriously interested in purchasing a solar photovoltaic system for your home or business but you don't really understand the practical aspects of selecting, sizing, siting, and estimating payback. You would also like to hear more about how to take advantage of state and federal incentives, accelerated depreciation, system performance, earning credits for generating more energy than you use (net metering), maintenance, and return on investment. Students will learn the benefits and costs of financing options that include the purchase, the lease, and power purchase

agreements (PPAs). Simulating an actual purchase process, students will estimate costs and benefits, purchase a solar photovoltaic system, or the energy produced by one, and determine return on investment based on their own history of electric and gas use, site and building efficiency factors, technical system performance, and state and federal incentives, and other market factors.

Solar Heating (Thermal) for Your Home or Business

CRN#4140 (changed from 2012), Thursday and Friday, 7:15 – 9:15 pm, October 4, 5, 11, and 12, Solar Energy Lab, (NoH), \$117, Instructor: Michael Kocsmiersky

The decision to purchase a solar heating (thermal) system for your home or office can be very complex. Many potential buyers or users of renewable solar energy systems question whether they should install solar photovoltaic (electric) or solar heating (thermal) systems. Most are surprised to learn that solar heating systems are not only less expensive but also offer less costly options for solar hot water and heating applications. Explore the comparative advantages and costs of solar thermal technology for your home or small office and find out how to take advantage of Connecticut's new solar thermal incentive program.

Find out how your hot water and perhaps heating costs can be lowered and your potential return on investment by purchasing a solar heating system. Simulating an actual purchase process, students will estimate costs and benefits, purchase a solar heating system, and determine return on investment based on their own history of electric and gas use, technical system performance, state and federal incentives, and other market factors. Our new solar energy lab includes several different solar thermal hot water systems that students will be able to observe and operate.

Solar Thermal Systems Credit Class

Solar Thermal Systems (Credit Class)

CRN#3831, Friday, 11 am – 3 pm, September 7 – December 14, Solar Energy Lab, (NoH) Instructor: John O'Brien (*See credit course schedule*)

Solar Thermal Systems follows the task analysis and learning objectives suggested by the North American Board of Certified

Energy Practitioners (NABCEP). Helpful to experienced contractors, plumbers and pipefitters, and individuals who have or seek to learn basic tool skills, this course covers site assessment, identification of solar thermal systems and components, appropriate installation techniques, system adaptations, start-up, troubleshooting, and workplace safety for solar hot water and space heating applications. Students also will learn how to diagram the sun's movement and how to measure how much solar irradiance (power) and solar irradiation (energy) are available on a building and collected in solar arrays. (NABCEP entry-level test eligible)

Sustainable Business Development

Sustainable Business Development Topics

[CRN#4096](#), Thursday, 7:30 – 9:30 pm, October 18 – December 6, Solar Energy Lab, (NoH) \$125, Instructor: Peter Curtis

The best strategies and practices for envisioning and launching your new or existing sustainable business will be presented this hands-on practical workshop mentored by the instructor and a team of special quest speakers--your coaches-- financial management experts, attorneys, accountants, bankers, marketing specialists--a community of local experts who bring you their know-how and willingness to share. Designed for both new businesses looking for a jump-start in the emerging green economy and leaders of existing companies transitioning to sustainability. Learn practical business development and leadership skills, and write and present your own business plan proposal as a final class project. The list of guest speakers will be published at the start of the new semester.

Building Science Applications for Practitioners

[CRN#4095](#), Thursday, 5 – 7 pm, October 18 – December 6, (NoH) \$175, Instructor: Andy Mayshar

Designed for home performance professionals with working experience in the residential building/remodeling industry, this program will be helpful in bringing your hands-on knowledge and skills to the next level. An advanced course in practical applications in home performance contracting, current building performance energy analysts and certified Building Performance Institute program

graduates will find the exercises and problem scenarios to be particularly relevant to their field. The primary objective of this course is to provide practical experience in the use of home performance diagnostic tools, accurate completion of audit forms, and effective use of energy modeling software.

Project Management Introduction

[CRN#4093](#), Tuesday, 6:30 – 8:30 pm, October 30 – December 4, (NH), \$175, Instructor: Gail Williams

How do organizations systematize the critical support and essential skills needed to efficiently organize projects and get things done? Project management offers a framework and a set of organizing tools recognized as effective practices that can work to establish internal procedures and customer feedback that demonstrate your ability to launch successful operational sustainability projects. Based on the models presented in “Effective Project Management: Traditional, Agile Extreme, 5th Edition,” students are invited to bring their own special projects to class to work on them by taking advantage of the best-of-breed project management approaches and tools today. A full review of process management is covered including managing continuous process improvement, procurement management, managing distressed projects, and managing multiple team projects. (This is not a software-supported class)

Geothermal Energy Systems Introductions

[CRN# 4090](#), Monday, 6 – 9 pm, September 10, 17, 24, Solar Energy Lab, (NoH) \$130, Instructor: Peter Governale

Learn the fundamentals of sizing and costing a geothermal system for your own home or business, including substantial incentives and rebates. Geothermal systems represent one of the most natural and efficient residential heating and cooling options in use today. The constant source of heat four feet underground provides a constant source of heat for the winter and cooling for the summer. Find out how ground source heat pumps can save 50% or more on heating and hot water costs and reduce overall energy consumption by 20-50%.

Green Business Incubators' Group

[CRN# 4100](#) Friday, 3 – 5 pm, September 14 – December 14, (No meeting November 23, NoH), \$20, Advisor: Dr. David N. Cooper

Seasoned and potential sustainable business start-up entrepreneurs are invited to join this forum to explore business development strategies and opportunities, innovative approaches, and targeted plans to envision new business undertakings, find investors and grow. Entrepreneurs and non-profits need help identifying government, education, and other NGO resources. An informal group setting will allow participants to explore business development ideas and resources, network with others seeking similar green business objectives, and consider business and workforce development educational options.